REMARKS / ARGUMENTS

I. General Remarks

Applicants respectfully request that the above amendments be entered and further request reconsideration of the application in view of the amendments and the remarks contained herein. Applicants thank the Examiner for carefully considering this application, including the references submitted by Applicants.

II. Disposition of Claims

Claims 77-88, 107-112, and 187-203 are pending in this application.

Claims 77-86, 88, 107-112, 187-195, and 197-203 stand rejected under 35 U.S.C. § 102(b). Claims 83, 86-88, 192, and 195-197 stand rejected under 35 U.S.C. § 103(a).

III. Rejections of Claims

A. Rejections Under 35 U.S.C. § 102(b)

Claims 77-86, 88, 107-112, 187-195, and 197-203 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,532,052 to Weaver *et al.* ("*Weaver*"). With respect to these rejections, the Office Action states:

> Weaver discloses a method for fracturing or acidizing a subterranean formation to substantially alter the fluid flow (permeability) and/or surface characteristics of the formation, said method including injecting into the formation an aqueous composition that can alter the properties of organic/aqueous fluids, said composition containing a branched water-soluble organic polymer containing unit(s), having a molecular weight of 900 to 50,000,000, that can be hydrophilic, hydrophobic or a combination thereof, and can further include a gelling agent and/or a proppant. (Abstract; col. 5, lines 1-10 and 30-65; col. 6, lines 29-65; col. 7, lines 7-33; col. 9, lines 32-37 and 49-63; col. 20, line 65 to col. 21, line 6; col. 21, lines 49-63; col. 38, lines 37-51; col. 39, lines 24-36; *See also*, Table 6 on col. 53-54 disclosing data of aqueous fluid diverting and water permeability reduction properties for an aqueous fluid containing a methoxypolyethylene oxide branched polydimethylaminoethyl methacrylate copolymer, sand, silica flour and bentonite)
>
> For example, an exemplary polymer disclosed in Weaver for treating subterranean oil producing formations has a cationic hydrophilic backbone modified with hydrophobic branches providing a desired hydrophobic-hydrophilic within the formation, thus altering the surface characteristic of the formation and the fluid flow or resistance to flow relative to a particular fluid, wherein the hydrophilic nature of the branched polymer serves as

an aqueous gelling agent that provides for an increase in fluid viscosity. (Col. 5, lines 11-16; col. 6, lines 65 to col. 7, line 40; col. 7, line 63 to col. 8, line 21; col. 10, lines 56-59; Table on col. 9-10) In Tables 23-28, Weaver discloses data for examples of treating a well by injecting into the well an aqueous solution containing a cationic polymer with nonionic branches.

The water-soluble branched polymer can have, in its backbone chain and/or in its branch chain, one or more heteroatom or groups, such as nitrogen, oxygen, phosphorous, sulfur, sulfur groups, amide, carboxyamide and carbonyl. (Col. 14, lines 17-23 and 52-59) The polymer units in either chain can be -R-X-, wherein R is a C_1 to C_6 alkyl radical and X represents a heteroatom and are preferably capped. (Col. 19, lines 36-65) Particularly, branched polymers containing polyamine and polyether linkages in the branches are preferred for altering fluid flow properties in the formation and are especially effective and stable at temperatures above 177° C. (Col. 13, lines 1-18)

Among the monomers disclosed in Weaver that can be used to form the branched polymer include dimethylaminoethyl methacrylate, acrylic esters, acrylamide, epichlorohydrin and chloroprene; wherein the polymeric unit/group can be derived from, e.g., saccharide or a derivative thereof (including cellulose and starch), vinyl, diallylic, amide or ether monomeric units, as long as it has the desired hydrophilic-hydrophobic property. (Col. 19, lines 7-10; col. 19, line 66 to col. 20, line 29; col. 22, lines 47-65) The vinyl or diene polymer units are represented by (Class 1, structure on col. 23); the amine type polymer units (Class III, structure on col. 24-25); the amide type polymer units (Class IV, structure on col. 25); whereas the saccharide and saccharide derivative units (Class V) are represented by the chemical structure depicted on col. 25-26, lines 43-59. (*See also*, the examples of class V on col. 35-36)

Weaver further discloses that a preferred class of polymers for altering aqueous fluid properties, such as altering water-oil ratio in a formation process and enhancing oil production, are polymers containing 2-hydroxylpropyl N,N dialkyl-amine as backbone units and acrylamide (organic acid derivative) and/or epichylorohydrin reacted polyalkoxide as the branch units. (Col. 42, lines 31-37) In Procedure O beginning on col. 50, line 5, Weaver discloses an example of altering the permeability of a formation surface (change in water-oil ratio) by injecting into the formation a copolymer of polydimethylaminoethyl methacrylate (PDMAEM having MW of 1 million) grafted with a polyethylene oxide branch (PEO, MVV of 15,000). The resulting data showing reduction in water permeability of the formation is shown in Tables 7 and 8.

> (*See also* Tables 10-13 on col. 57-59 for permeability data of an aqueous treating solution containing 1% of a hydrophilic PDMAEM polymer (MW of 600-800K) branched with a hydrophobic methoxy-polyethylene glycol epichlorohydrin (MPEO) adduct; particularly, polymer #7 of Table 10). In Tables 14-15 on col. 59, Weaver further discloses PDMAEM:PEO/MPEO weight ratios for the branched polymer ranging from 0.5:1.0 to 1.25 to 0.35.
>
> Finally, regarding the limitation in independent claims 77 and 187 concerning the hydrophobically modified water-soluble polymer reducing the permeability of the subterranean formation to an aqueous-based fluid, Weaver discloses results demonstrating reduction in water permeability in the same examples containing the modified polymer discussed above (immediately preceding paragraph) in Tables 10-13 and 14-14 on col. 57-60. (*See, e.g.*, Sample #7 on Table 10, showing a reduction in water permeability of 85%)
>
> Thus, the claims are anticipated by Weaver.

(Office Action at ¶ 4.) Applicants respectfully disagree with these rejections.

In order to form a basis for a rejection under 35 U.S.C. § 102(b), a prior art reference must disclose each and every element as set forth in the claim. MANUAL OF PATENT EXAMINING PROCEDURE ("MPEP") § 2131 (2006). "'The identical invention must be shown in as complete detail [in the prior art reference] as is contained in the claim.'" *Id.* However, *Weaver* does not disclose each element of Applicants' claims.

Specifically, contrary to the assertion in the Office Action, *Weaver* does not disclose a hydrophobically modified water-soluble polymer that reduces the permeability of the subterranean formation to an aqueous-based fluid, as recited in independent claims 77 and 187. Indeed, *Weaver* discloses that branched polymers containing a hydrophobic modifying portion function to increase water permeability:

> In yet another aspect of the invention, another class of polymers can be prepared which have some hydrophobic and/or oleophilic portions, branches or overall nature so that these polymers can be attached to formations or suspended within fluids in the formation to produce a surface effect on the particles or formation which retards the flow of organic fluids or hydrocarbon fluids and increases the permeability of the formation to aqueous fluids or would tend to gel hydrocarbon or organic based fluids.

(*Weaver* at col. 7, ll. 43-52 (emphasis added).) In fact, *Weaver* only teaches the use of hydrophilically-modified polymers to reduce the water permeability of a formation. (*See Weaver*

at col. 19, ll. 13-18 ("For one preferred class of polymers used to reduce the flow of water through earthen formations . . . the branched chain and overall polymer should be hydrophilic with the branched chain having from about 2-50,000 repeating polymer units."); *id.* at col. 57, ll. 1-45 (achieving 85% water-permeability reduction with a graft copolymer having a hydrophilic poly(dimethylaminoethyl methacrylate) backbone and hydrophilic methoxy-polyethylene glycol branches).) Thus, *Weaver* clearly does not teach the use of polymers with hydrophobic portions to reduce the permeability of the subterranean formation to an aqueous-based fluid.

The Office Action cites the experimental data in Tables 7, 8, and 10-13 of *Weaver* which show the use of polymers containing 2-hydroxypropyl N,N dialkyl-amine as backbone units and acrylamide (organic acid derivative) and/or epichlorohydrin reacted with polyalkoxide as the branch units used to reduce the permeability of a formation to aqueous-based fluids as teaching the claimed hydrophobically modified polymer. (*See* Office Action at ¶ 4.) Even more specifically, the Office Action equates a polyethylene oxide branch and a methoxy-polyethylene oxide with hydrophobic branches. *See id.* However, Applicants respectfully submit that branches of polyethylene oxide or methoxy-polyethylene oxide (*i.e.*, glycols) are hydrophilic, not hydrophobic. Indeed, these branches are examples of the hydrophilic branches discussed above that *Weaver* teaches to reduce the permeability of a formation to aqueous fluids. Therefore, the experimental data relied on in the Office Action does not disclose a hydrophobically modified water-soluble polymer that reduces the permeability of the subterranean formation to an aqueous-based fluid, as recited in independent claims 77 and 187.

Because *Weaver* does not disclose each element of claims 77 and 187, Applicants respectfully assert that *Weaver* cannot anticipate these claims, and claims 77 and 187 are allowable over *Weaver*. Moreover, since "a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers," and since claims 78-86, 88, 107-112, 188-195, and 197-203 depend, either directly or indirectly, from independent claim 77 or 187, these dependent claims are allowable for at least the same reasons. *See* 35 U.S.C. § 112 ¶ 4 (2004). Accordingly, Applicants respectfully request the withdrawal of these rejections.

B. Rejections Under 35 U.S.C. § 103(a)

Claims 83, 86-88, 192, and 195-197 stand rejected under 35 U.S.C. § 103(a) as being obvious over *Weaver* in view of U.S. Patent No. 6,358,889 to Waggenspack *et al.* ("*Waggenspack*"). With respect to these rejections, the Office Action states:

> Weaver was discussed above. Weaver discloses the hydrophobic branch attached to the backbone of the hydrophilic polymer to contain an ester or amide. However Weaver does not specifically disclose the hydrophobic branch to be a succinic acid derivative.
>
> On the other hand, Waggenspack teaches well drilling and servicing fluids that include an aqueous fluid containing a hydrophobically modified chitosan polymer (a glucosamine polysaccharide derivative), wherein said modified chitosan polymer is formed from the in-situ reaction of a chitosan polymer with an anhydride modifying compound, such as succinic anhydride, dodecynylsuccinic anhydride or any other alkenyl succinic anhydride having a C_2 to C_{20} alkenyl claim. (Abstract; col. 3, line 65 to col. 4, line 6; col. 5, lines 33-65; col. 14, lines 48-67; Example 1)
>
> Waggenspack further teaches that adding the modified chitosan water-soluble polymer increases the viscosity of the aqueous fracturing/servicing fluid, thus providing the fluid with enhanced low shear rate viscosity that is shear thinning. (Col. 1, lines 15-22 and 36-57; col. 3, lines 13-21)
>
> Therefore, it would have been obvious to a person of ordinary skill in the art at the time that the invention was made to use the modified chitosan copolymer taught in Waggenspack as the hydrophobically modified hydrophilic polymer injected in Weaver's method of acidizing a subterranean formation. It would have been obvious for one skilled in the art to do so to attain a more cost-effective method of acidizing by using a more viscous aqueous fluid having superior shear properties as taught by Waggenspack, and thus efficiently attain a desired level of surface permeability of the subterranean formation.
>
> Thus, the claims are unpatentable over Weaver and Waggenspack.

(Office Action at ¶ 6.) Applicants respectfully disagree with these rejections.

In order to form a basis for a § 103(a) rejection, a prior art reference or combination of prior art references must teach or suggest each element of the claim. MPEP § 2143. However, as discussed in Section III.A. above, *Weaver* does not teach or suggest a hydrophobically modified water-soluble polymer that reduces the permeability of the subterranean formation to an aqueous-based fluid, as recited in independent claims 77 and 187.

Nor does *Waggenspack* teach or suggest this element. Therefore, since neither *Weaver* nor *Waggenspack* teaches this element of claims 77 and 187, that combination of references cannot obviate claims 77 and 187. Since claims 83, 86-88, 192, and 195-197 depend, either directly or indirectly, from claim 77 or 187, these dependent claims also incorporate these limitations that none of the references teach or suggest, and are thus similarly allowable. *See* 35 U.S.C. § 112 ¶ 4 (2004).

IV. No Waiver

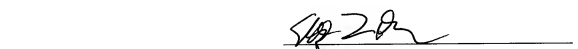
All of Applicants' arguments and amendments are without prejudice or disclaimer. Additionally, Applicants have merely discussed example distinctions from the cited references. Other distinctions may exist, and Applicants reserve the right to discuss these additional distinctions in a later Response or on Appeal, if appropriate. By not responding to additional statements made by the Examiner, Applicants do not acquiesce to the Examiner's additional statements. The example distinctions discussed by Applicants are sufficient to overcome the outstanding rejections.

SUMMARY

In light of the above remarks and amendments, Applicants respectfully submit that the Amendment is now compliant and is now in condition for examination by the Examiner. Should the Examiner have any questions, comments or suggestions in furtherance of the prosecution of this application, the Examiner is invited to contact the attorney of record by telephone, facsimile, or electronic mail.

Applicants believe that there are no fees due in association with the filing of this Response. However, should the Commissioner deem that any additional fees are due, including any fees for extensions of time, Applicants respectfully request that the Commissioner accept this as a Petition Therefor, and direct that any additional fees be charged to Baker Botts L.L.P. Deposit Account No. 02-0383, Order Number 063718.0321.

Respectfully submitted,



Elizabeth L. Durham
Registration No. 59,509
BAKER BOTTS L.L.P.
One Shell Plaza
910 Louisiana
Houston, TX 77002
Telephone: 713.229.2104
Facsimile: 713.229.7704
Email: liz.durham@bakerbotts.com

Date: May 21, 2007